

City of Vacaville

Salinity Source Control



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Presentation Outline

1. **NPDES Permit Requirements**
2. **Workplan Development**
3. **Phase I: Salinity Source Identification**
 - ❖ Results & Conclusions
4. **Phase II: Salinity Source Reduction**
 - ❖ Results & Conclusions
5. **Lessons Learned & Future Plans**



NPDES Permit Requirements

Conduct a *Salinity Source Control Study* which:

- Evaluates sources of salts in the WWTP effluent;
- Addresses salt reduction and/or source control alternatives;

and then

- Implement salt reduction and/or source control alternatives.



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NPDES Permit Requirements cont...

This *Salinity Source Control Study* to be accomplished in accordance with the following time schedule:

<u>Task</u>	<u>Date Due</u>
Submit Workplan and Time Schedule	1 July 2001
Begin Study	1 September 2001
Complete Study	1 September 2002
Submit Study Report	1 December 2002

Phase I

Implement Corrective Action measures	1 March 2003
Submit Annual Progress Report	1 March each year
Submit Effectiveness Assessment Report	1 March 2006

Phase II



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WORKPLAN DEVELOPMENT

Workplan separated study into two phases

- **Phase I:** Conduct Salinity Source Identification Study.
 - Conduct sampling and analysis
 - Quantify major salinity source categories.
 - Identify opportunities for potential source reduction measures
- **Phase II:** Implement, if possible, or investigate Salinity Source Reduction Measures.

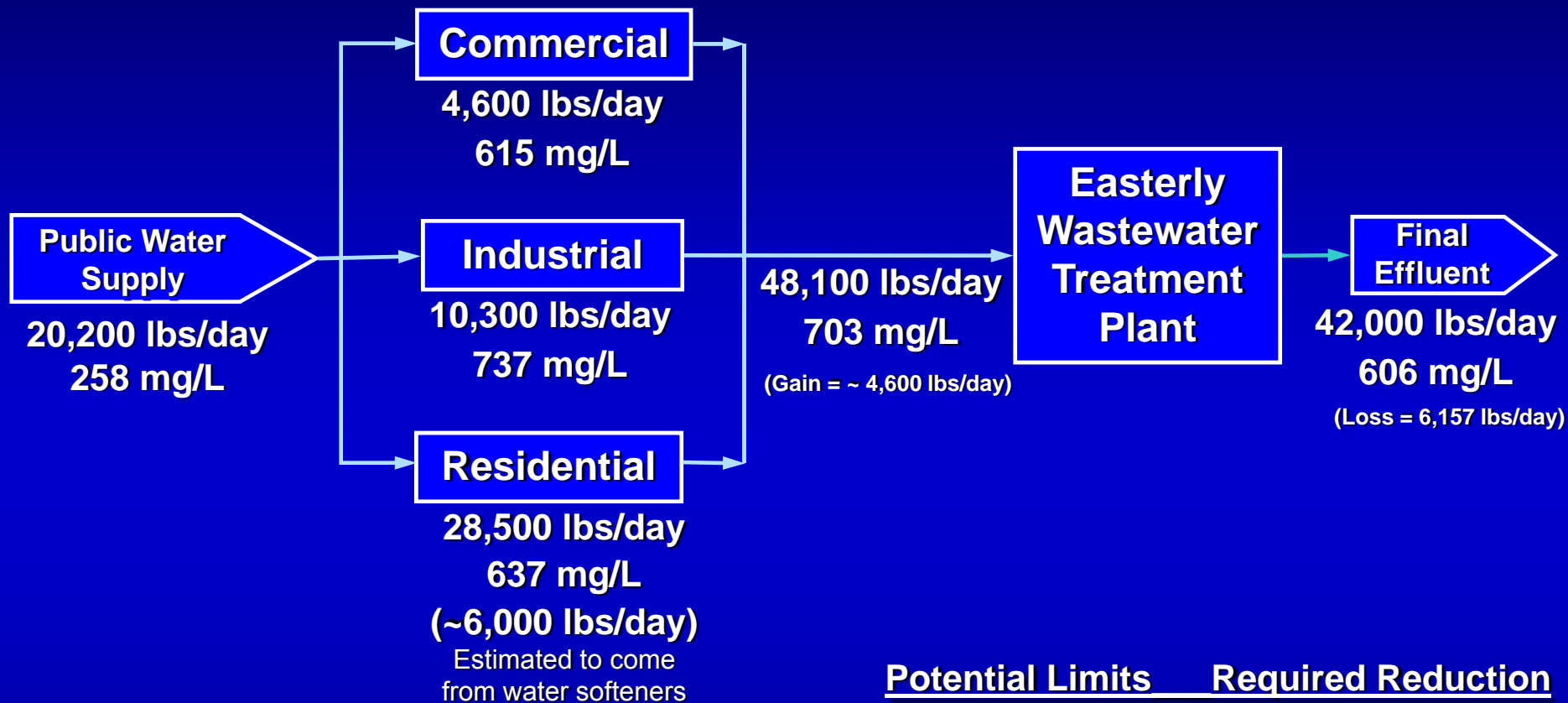


Phase I: Salinity Source Identification

- **Conducted literature search & reviewed existing data and data sources.**
- **Developed sampling, analysis, and data collection plan.**
- **Conducted sampling & analysis; established statistically valid database.**
- **Conducted mass balance; established baseline.**



PHASE I: Results



ΔSalinity 100% = ~ 27,900 lbs/day

Potential Limits Required Reduction

Δ Ag Goal (39%) = 16,500 lbs/day

Δ 500 > Bkgd (20%) = 8,300 lbs/day

Δ DW MCL (19%) = 7,900 lbs/day



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PHASE I: Conclusions

- Domestic wastewater is the largest source of salinity (mass loading basis) when compared to industrial and commercial sources.
- Domestic wastewater has the largest net increase in salinity mass loading relative to background.
- Industrial sources had the greatest increase in salinity concentration.



PHASE II: Salinity Source Reduction

- **Public outreach targeted at reducing salinity from domestic & commercial water softeners through public awareness.**
- **Evaluate potential for local ordinance establishing water softener restrictions.**
- **Evaluate potential for acquiring an alternative water source.**
- **Require Industrial Users to conduct source control studies; implement TDS BMP's**



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PHASE II: Results & Conclusions

Public Outreach

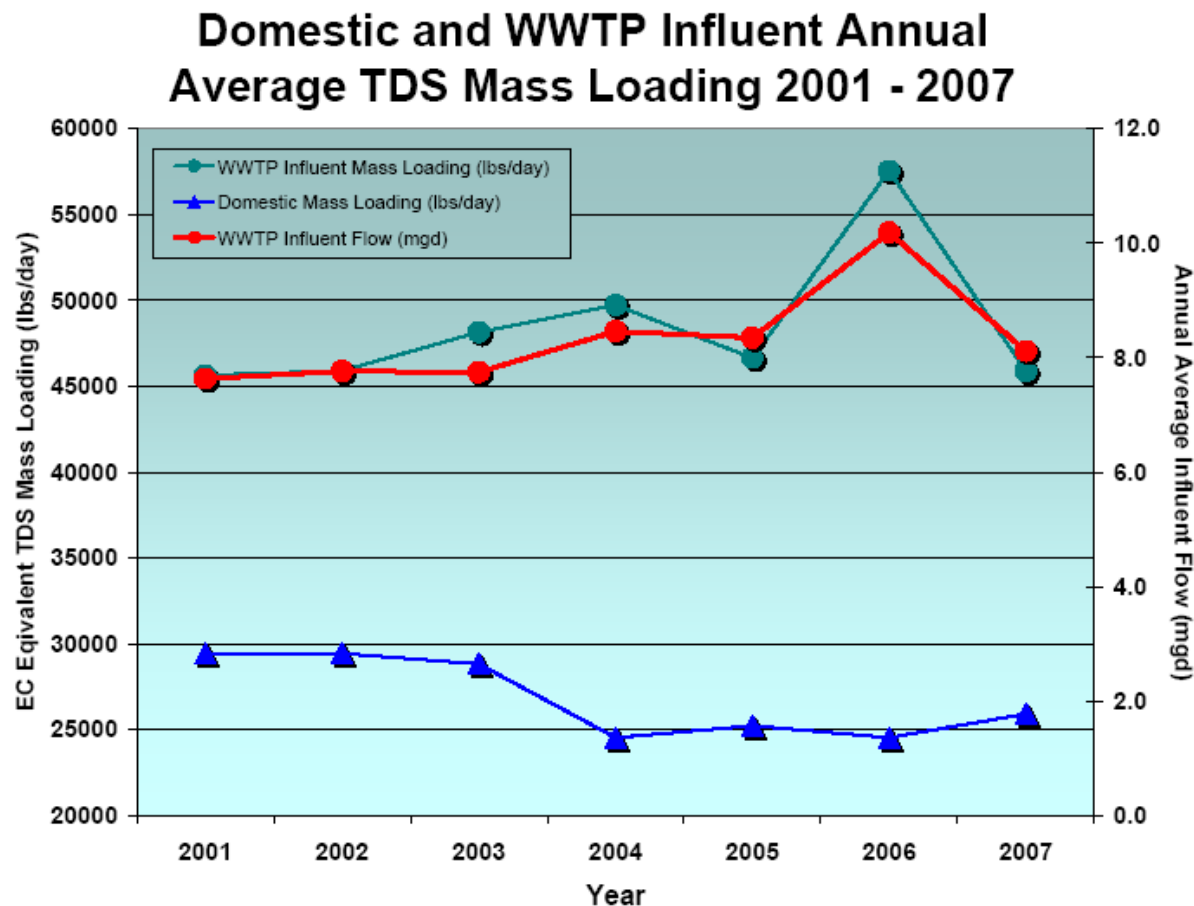
- **Public outreach efforts showed a negative or neutral response to voluntary reductions.**
- **Households non-receptive to installation of alternative systems/configurations due to increased capital and/or operating costs.**
- **No measurable behavioral changes and no statically significant reductions in influent salinity levels were realized.**



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PHASE II: Results & Conclusions

Public Outreach (cont)



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PHASE II: Results & Conclusions

Local Ordinance Development

- **Public sentiment toward water softener ordinance, as part of public outreach efforts, produced a negative response.**
- **Local Ordinance not legally defensible under AB 334.**



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PHASE II: Results & Conclusions

Alternative Water Source

- **City obtained 9,300 acre-feet of Delta water to be used for future growth (lower salinity than well water).**
- **Future growth should result in gradual reduction in percentage of groundwater that makes up combined City water supply.**
- **Decrease percentage of groundwater should decrease salinity levels of combined City water supply.**



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PHASE II: Results & Conclusions

Industry Salinity Source Control Studies

- Major industrial users have limited source control opportunities.
- Industrial user salinity BMP's, for the most part, document existing operational practices aimed at minimizing operating costs.
- No statistically significant reductions in industrial user TDS levels have been observed relative to baseline levels.



LESSONS LEARNED

- Greater emphasis on industry monitoring of source water salinity levels for comparison with wastewater salinity levels.
- Conduct surveys during Phase I to validate estimated salinity contributions from domestic water softeners.
- Multiple domestic sampling locations based on known source water quality data.
- Public Education that focuses on economic impact of various reduction options.



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FUTURE PLANS

- **Establish requirements for industries to monitor source water salinity; report changes in concentration and mass loading.**
- **Validation of salinity mass loading from domestic water softeners.**
- **Validation of salinity mass loading from commercial water softeners.**
- **Public Education focused on economic impact of various salinity reduction options.**



QUESTIONS?

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